

What is claimed is:

1. A substrate voltage generating circuit comprising:
 - a first power supply node supplied with a first potential level;
 - 5 a second power supply node supplied with a second potential level lower than the first potential level;
 - an output node receiving a voltage having a third potential level lower than the second potential level;
 - a level shift circuit which is coupled between the first power
 - 10 supply node and the output node, which receives an input signal having the first and second potential levels, and which outputs an output signal having the first potential level and the third potential level; and
 - a switch circuit which connects the second power supply node
 - 15 to the output node in response to the output signal.

2. The substrate voltage generating circuit according to Claim 1, wherein the level shift circuit comprises:
 - a first transistor of a first conductivity type which has a gate
 - 20 receiving the input signal, a source connected to the first power supply

node, and a drain;

a second transistor of the first conductivity type which has a gate receiving the input signal, a source connected to the first power supply node, and a drain coupled to the switch circuit;

5 a third transistor of a second conductivity type which has a gate connected to the gate of the first transistor, a source, a drain connected to the drain of the first transistor, and a gate oxide film having a first thickness;

10 a fourth transistor of the second conductivity type which has a gate connected to the gate of the second transistor, a source, a drain connected to the drain of the second transistor, and a gate oxide film having the first thickness;

a fifth transistor of the second conductivity type which has a gate connected to the drain of the second transistor, a source connected to the output node, a drain connected to the source of the third transistor, and a gate oxide film having a second thickness thinner than the first thickness; and

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a sixth transistor of the second conductivity type which has a gate connected to the drain of the first transistor, a source connected to the output node, a drain connected to the source of the fourth

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transistor, and a gate oxide film having the second thickness.

3. The substrate voltage generating circuit according to Claim 1,
wherein the level shift circuit comprises:

5 a first transistor of a first conductivity type which has a gate
receiving the input signal, a source connected to the first power supply
node, and a drain;

 a second transistor of the first conductivity type which has a
gate receiving the input signal, a source connected to the first power
10 supply node, and a drain coupled to the switch circuit;

 a third transistor of a second conductivity type which has a gate
connected to the drain of the second transistor, a source, a drain
connected to the drain of the first transistor, and a gate oxide film
having a first thickness;

15 a fourth transistor of the second conductivity type which has a
gate connected to the drain of the first transistor, a source, a drain
connected to the drain of the second transistor, and a gate oxide film
having the first thickness;

 a fifth transistor of the second conductivity type which has a
20 gate connected to the gate of the first transistor, a source connected to

the output node, a drain connected to the source of the third transistor, and a gate oxide film having a second thickness thinner than the first thickness; and

5 a sixth transistor of the second conductivity type which has a gate connected to the gate of the second transistor, a source connected to the output node, a drain connected to the source of the fourth transistor, and a gate oxide film having the second thickness.

4. The substrate voltage generating circuit according to Claim 1,
10 wherein the switch circuit comprises:

a switching element which has a control electrode receiving the output signal, a first electrode connected to the second power supply node, and a second electrode connected to the output node; and

15 a capacitor coupled between the first electrode and the control electrode.

5. The substrate voltage generating circuit according to Claim 1, wherein the second potential level is 0 volt.

20 6. The substrate voltage generating circuit according to Claim 1,

wherein the third potential level is a negative voltage level.

7. A voltage level shifting circuit comprising:

5 a first transistor of a first conductivity type which has a gate receiving an input signal, a source connected to a first supply node supplied with a first potential level, and a drain;

a second transistor of the first conductivity type which has a gate receiving the input signal, a source connected to the first supply node, and a drain coupled to an output node;

10 a third transistor of a second conductivity type which has a gate connected to the gate of the first transistor, a source, a drain connected to the drain of the first transistor, and a gate oxide film having a first thickness;

15 a fourth transistor of the second conductivity type which has a gate connected to the gate of the second transistor, a source, a drain connected to the drain of the second transistor, and a gate oxide film having the first thickness;

a fifth transistor of the second conductivity type which has a gate connected to the drain of the second transistor, a source connected to a second supply node supplied with a second potential level lower

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than the first potential level, a drain connected to the source of the third transistor, and a gate oxide film having a second thickness thinner than the first thickness; and

5 a sixth transistor of the second conductivity type which has a gate connected to the drain of the first transistor, a source connected to the second supply node, a drain connected to the source of the fourth transistor, and a gate oxide film having the second thickness.

10 8. The substrate voltage generating circuit according to Claim 7, wherein the first potential level is a positive voltage level and the second potential level is a negative voltage level.

 9. A voltage level shifting circuit comprising:
15 a first transistor of a first conductivity type which has a gate receiving an input signal, a source connected to a first supply node supplied with a first potential level, and a drain;

 a second transistor of the first conductivity type which has a gate receiving the input signal, a source connected to the first supply
20 node, and a drain coupled to an output node;

a third transistor of a second conductivity type which has a gate connected to the drain of the second transistor, a source, a drain connected to the drain of the first transistor, and a gate oxide film having a first thickness;

5 a fourth transistor of the second conductivity type which has a gate connected to the drain of the first transistor, a source, a drain connected to the drain of the second transistor, and a gate oxide film having the first thickness;

10 a fifth transistor of the second conductivity type which has a gate connected to the gate of the first transistor, a source connected to a second supply node supplied with a second potential level lower than the first potential level, a drain connected to the source of the third transistor, and a gate oxide film having a second thickness thinner than the first thickness; and

15 a sixth transistor of the second conductivity type which has a gate connected to the gate of the second transistor, a source connected to the second supply node, a drain connected to the source of the fourth transistor, and a gate oxide film having the second thickness.

20 10. The substrate voltage generating circuit according to Claim

9, wherein the first potential level is a positive voltage level and the second potential level is a negative voltage level.